REMARKS

Claims **8, 9, 11** and **13** were amended to recite galvanometer-driven scanners or scanning. New dependent claims **14-19** were added. Following the present amendment, claims **1-19** are pending in the application.

Newly added claims **14-19** are fully supported by the written description as filed. For claims **14** and **19**, see page 4 lines 20-24 and Fig. 2. For claim **18**, see page 9, lines 15-16 and 21-24.

Claim **10** was allowed, while claims **1-9** and **11-13** were rejected. Applicants thank the Examiner for the allowance of claim **10**. The Examiner's rejections are traversed below.

35 U.S.C. §102, 103

Claim **8** was rejected under 35 USC 102(b) as anticipated by Heanue et al. (US 6,301,403). It appears that a rejection under 35 USC 102(e), rather than 102(b), was intended, and applicants will so treat the rejection in order to advance prosecution.

Claim **8** was amended to recite galvanometer-driven scanners or scanning. The Office Action states (with reference to claims **1-7** and **12-13**) that Heanue teaches an optical switch comprising "a first galvanometer (item 57) coupled to the first mirror," and "a second galvanometer (item 56) coupled to the second mirror." Applicants submit that Heanue et al. do not teach or suggest using galvanometers for rotating optical switch mirrors. A galvanometer employs a magnetic-based driving mechanism for rotating its corresponding mirror (see page 5 line 33 through page 6 line 2 of the specification). A galvanometer includes a rotor capable of rotation within a stator under the control of a magnetic field, in a design that can be thought of as similar in principle to those used in conventional magnetic compasses. The items 56 and 57 of Heanue et al. are rotary electrostatic microactuators built on chips (see column 3 lines 32-37 and 56-61 of Heanue et al.).

Applicants submit that a skilled artisan would not have been motivated to replace the electrostatic microactuators of Heanue et al. with galvanometers. In fact, by emphasizing that their switch is a microswitch, Heanue et al. teach away from replacing their electrostatic microactuators with galvanometers, which are ordinarily significantly larger in size than electrostatic microactuators built on a chip. Heanue et al. distinguish microswitches from

switches using macroscopic rotators in their Background section (columns 1-2 of Heanue et al.). Furthermore, Heanue et al. repeatedly refer to their switch using the term "microswitch," (see the title, Summary, and Description of the Invention of Heanue et al.), and refer to the small form factor of their switch (see e.g. column 2 lines 5-7, and column 19 lines 8-10 of Heanue et al.). In light of Heanue et al.'s teachings, Applicants respectfully submit that a skilled artisan would not have been motivated to use galvanometers in the Heanue et al. system. Claim **8** is submitted to be patentable in light of the prior art of record.

Claims **1-7** and **12-13** were rejected under 35 USC 103(a) as unpatentable over Heanue et al. in view of Tiao et al. (US 5,920,667). The Office Action states that "it would have obvious [...] to use individual fiber collimators with each fiber in the system of Heanue as taught by Tiao since the creation of a distinct signal "on" and "off" condition would allow the input of the switch system to couple to the output end of the system under only one alignment situation. One of ordinary skill would see a further benefit of this alignment condition to be the reduction of channel crosstalk between fibers in the system of Heanue."

First, Tiao et al. describe using a stepping motor 6 to drive their optical switch (see column 3 line 35 of Tiao et al.). Applicants submit that neither Heanue et al. nor Tiao et al. teach or suggest using <u>galvanometer-driven</u> scanning as claimed. Claims **1-7** and **12-13** are thus submitted to be patentable over Heanue et al. in view of Tiao et al.

Second, applicants submit that it would not have been obvious to one of ordinary skill in the art to use the fiber collimators taught by Tiao et al. in the system of Heanue et al. Using conventional fiber collimators at the ends of the optical fibers in the parallel fiber bundle of Heanue et al. would have rendered the Heanue et al. system inoperable, or at least significantly degrade the insertion loss of the Heanue et al. system. Thus, a skilled artisan wishing to reduce channel crosstalk in the system of Heanue et al. would not be motivated to employ fiber collimators at the fiber ends of the Heanue et al. bundle, because of the resulting substantial increase in insertion losses and likely inoperability of the modified system. Claims **1-7** and **12** are thus submitted to be patentable over Heanue et al. in view of Tiao et al.

Claim **9** was rejected under 35 USC 103(a) as unpatentable over Heanue et al. in view of Geiger (US 5,299,054). Claim **11** was rejected under 35 USC 103(a) as unpatentable over Heanue et al. in view of Geiger and Tiao. Claims **9** and **11** were amended to recite

galvanometer-driven scanning, and are submitted to be patentable over the prior art of record for the reasons set forth above.

Applicants note that claims **3-4** and **16-17** recite an exact optical pathlength condition accounting for a <u>dependence of optical pathlength on mirror orientation</u>, which corresponds to an <u>aspherical</u> surface for a free-space system (see page 6 line 32 through page 9 line 13 of the specification). Applicants note that Tiao et al. do not teach or suggest meeting such a pathlength condition.

In light of the above, Applicants respectfully submit the instant claims to be patentable in view of the prior art of record, and request the Examiner to indicate the allowability of the instant claims in the next Office Action.

Respectfully submitted,

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